25226-013-GEV-TD-00001

Contract No. TOURDPPI060072

Project No. CSNHS-008-00(256)

P.I. No. 0008256

Review of Exceptions and Variances

WORK-IN-PROGRESS

Prepared by:

Submitted to:

December 2009

Northwest Corridor Design – I-75 - Exceptions/Variance

Date	Revision	Author	Status
12/14/2009	A	M. Moseley	Printed per GDOT's Termination for Convenience Direction.

Northwest Corridor Design – I-575 - Exceptions/Variance

Date	Revision	Author	Status
12/14/2009	A	S. Linley	Printed per GDOT's Termination for Convenience Direction.

Note: Georgia Department of Transportation (GDOT) terminated Contract Number TOURDPPI60072 for its convenience prior to the completion of all work under that contract and directed that the work with respect to this document be discontinued.

(a) This document was not completed at the time of GDOT's direction and the information contained herein is not complete and/or has not been fully verified or checked. This document is a work-in-progress and is presented only as such.
(b) Any user is cautioned that the use of this document and any related information or calculations, without access to pertinent factors and without proper regard for their purpose, could lead to erroneous conclusions.
(c) If any such calculations or any information contained herein is used in future work efforts or any follow on design work activity, a complete confirmation of the information contained herein should be performed prior to any such use.
(d) GTP has no responsibility for the use of this information not under its direct control.

Review of Design Exceptions & Variances

The Department has issued its notice to terminate for convenience the Developer Services Agreement per a letter received by GTP on November 2, 2009. As part of this termination, the Department directed GTP to provide the pending deliverables and work product in the state and manner described in Attachment A to the termination for convenience letter.

After a short exercise to get the plans prepared for transmittal, GTP discontinued all work on the "costing plans" identified as a deliverable in Services Order 13, as directed by the Department. Because work on the costing plans was discontinued prior to completion of Services Order 13, the plans are incomplete and have been identified accordingly. They were submitted to the Department on December 10, 2009 via letter number 25226-TCM-GAM-00355.

Similarly, the Department requested the exceptions and variances be prepared, consistent with the design documents submitted. The exceptions/variances are also labeled as incomplete because the design is a categorized as a work-in-progress therefore the exceptions/variances are also of the same status. The note cautioning the user to the status of this document, including the appendices is affixed to the title page.

The following documents are attached as Appendices:

Request for Design Exception – Lane Widths – NWC-E-001

Request for Design Exception – Reduced Shoulders under Bridges – NWC-E-002

Request for Design Exception – Reduced Shoulders Managed Lanes – NWC-E-003

Request for Design Exception – Reduced Shoulder General Purpose Lanes – NWC-E-004

Request for Design Exception – Reduced Shoulders under Bridges – NWC-E-005

Request for Design Exception – Reduced Shoulders Managed Lane – NWC-E-006

Request for Design Variance – Vertical Clearance – NWC-V-001

The following discussion provides a brief summary of the appended requests for Exceptions/Variance.

1.0 General Description

The attached design exceptions/variance relates to shoulder widths, lane widths and vertical clearance. The shoulder widths are presented in several separate exceptions. There are unique design exception requests for the managed lanes, the I-75 and I-285 general purpose lane shoulders and shoulders that are reduced under existing overpass bridges. There are separate exceptions for the reduced lane widths. The lone design variance pertains to a vertical clearance issue.

The design variance for vertical clearance could be revised to an exception pending further coordination with Georgia Power Transmission. At this time, the reversible managed lanes would cross the I-75 southbound exit to North Marietta Pkwy on bridge structure. Also at this location there are two (2) Georgia Power Transmission lines, 115 kV and 230 kV that require substantial clearance. The reversible managed lanes would be pinched between the power lines and the ramp. The proposed structure depth has been minimized so to maintain the power lines further reduction in the vertical clearance on the ramp could be an option. The clearance as currently designed is 16 ft 6 in, which meets current AASHTO policy. The clearance provided for the Georgia Power Transmission lines has not been verified at this time.

There are several locations along the reversible managed lanes where shoulders could limit stopping sight distance. The key locations occur on bridges where the barrier height is 2 ft 8 in. Based on the height of object and height of driver as defined in the 2004 AASHTO Geometric Design of Highways and Streets the sight line was verified to meet the appropriate stopping sight distance. In the calculations the height of the driver could see over the barrier and see the object for the necessary length. At this time several factors could negatively impact the sight distance at these locations. One is that the locations of sound walls are still yet to be determined. If any of these locations require sound wall either a design exception will be needed or additional shoulder would need to be provided. These exceptions would be in addition to those appended herein. The second issue is the height of barrier on bridges. Currently GDOT uses a taller barrier on the median side of bridges, 3 ft 6 in. Since the reversible managed lanes are proposed along the outside of I-75 there is no median side. So the current use of the 2 ft 8 in barrier does not limit the driver's sight line in the way a taller barrier would. If either of these factors were to change, sight distance would require further evaluation and possible additional exceptions or design change.

2.0 Design Issues

There are three (3) locations on I-575 as depicted in the Rev C drawings where the general purpose lanes do not provide a stopping sight distance as required for a design speed of 65 mph. The locations are in the vicinity of Hawkins Store Rd, Towne Lake Pkwy and Old Rope Mill Rd. The sight distance is limited due to smaller radius curves and the introduction of precast barriers with glare screens. The planned solution was to refine the alignment of the reversible managed lane to increase the I-575 northbound general purpose inside shoulder to meet the 65 mph stopping sight distance. Due to the termination notice for convenience this alignment refinement was not completed. A design exception is not submitted for stopping sight distance at this time because it is thought that there is an economical solution that will meet the guideline. Prior to design completion, these shoulders need to be revised, or a design exception pursued, consistent with the final design.

3.0 Summary

Work on the NW Corridor costing plans, Projects NH000-0073-03(242) and NH000-0575-01(028) in Cobb/Cherokee Counties, were discontinued, as the contract was terminated for convenience by GDOT. Therefore the drawings, Rev C, are considered a work in progress. The design exceptions/variance included herein should also be considered a work in progress to the extent that the Rev C drawings were not complete, and the exceptions/variance was compiled at the time of the Rev. C plans. Therefore, the design exceptions/variance pertains solely to those features that require approval by GDOT/FHWA in the Rev C drawings. The design issue regarding stopping sight distance on I-575 is not contemplated to necessitate a design exception because design refinements will result in a design that would meet the guidelines.

APPENDICES

Request for Design Exception – Lane Widths – NWC-E-001

Request for Design Exception – Reduced Shoulders under Bridges – NWC-E-002

Request for Design Exception – Reduced Shoulders Managed Lanes – NWC-E-003

Request for Design Exception – Reduced Shoulder General Purpose Lanes – NWC-E-004

Request for Design Exception – Reduced Shoulders under Bridges – NWC-E-005

Request for Design Exception – Reduced Shoulders Managed Lane – NWC-E-006

Request for Design Variance – Vertical Clearance – NWC-V-001

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0073-03(242), Cobb County** I-75 Reversible Managed Lanes P.I. No. 714130	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Exception – Lane Width – NWC-E-001**		

Approval of a Design Exception is requested for this project.

PROJECT DESCRIPTION

NH000-0073-03(242) would add reversible managed lanes along I-75 in Cobb County. The project crosses the city limits of both Marietta and Kennesaw. The managed lanes would be located outside and west of the existing general purpose lanes on I-75 from I-285 to just south of I-575. The anticipated profile in this area is mostly elevated to limit disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. The managed lane typical section between Windy Hill Rd and I-575 consists of two (2) – 12 ft lanes with a 10 ft shoulder to the west and a 2 ft shoulder on the east. The eastern shoulder varies from the base condition of 2 ft to 12 ft to address sight distance problems. At I-575 the two managed lanes would split and one lane is added in the median of both I-575(NH000-0575-01(028), PI No. 713640) and I-75. In each location the managed lane is adjacent to the northbound travel lanes. The typical section north of I-575 is one 12 ft lane with a 10 ft shoulder to the west and 4 ft shoulder to the east. The managed lanes would be planned for a 55 mph speed design. There would be managed lane interchanges at Terrill Mill Rd, Roswell Rd, Big Shanty Connector (Future construction) and Hickory Grove Rd.

On I-75 the project would begin just south of Akers Mill Rd with the extension of the existing HOV lanes north to 1,000 ft north of Windy Ridge Pkwy. At this point a flyover ramp is proposed to connect I-75 to the reversible managed lanes on the west side of existing I-75. I-75 southbound general purpose lanes are proposed to be relocated west between Windy Hill Rd and Windy Ridge Parkway to accommodate this flyover ramp. From this point the managed lanes remain west of I-75 general purpose lanes on either bridge or wall structure. The construction limits on I-75 in the area of I-285 would begin at mile post 258.4 and end at mile post 260.

At Bells Ferry Rd the managed lanes would transition from the western outside location to the median of I-75. Both I-75 southbound and northbound general purpose lanes are partially relocated to the outside to create the necessary width for the interior managed lanes. From the median location one lane would continue north to Hickory Grove Rd on I-75 and one lane would exit to I-575 via a ramp over the I-75 northbound general purpose lanes. The limits of construction on I-75 at the I-575 interchange would begin at mile post 267.8 and end at mile post 269.

On I-75 in the area of Hickory Grove Rd the northbound general purpose lanes and also partially relocated to the outside to provide the necessary median width for the managed lane interchange. The widening and relocation of I-75 northbound would occur from mile post 273.3 to mile post 274.6.

On I-285 connections are provided into the reversible managed lanes. The connections to I-285 are unique on each side of I-285. To the west of I-75 the reversible managed lanes would connect to I-285 via a single lane reversible ramp that enters/exits from the median. On the east side of I-75 single lane directional ramps are proposed for both I-285 eastbound and westbound. The directional ramps were proposed on the east side of I-75 through coordination with the Department and the Revive I-285 managed lane study. The limits of construction on I-285 would stretch from mile post 20.2 to mile post 20.9.

FEATURES REQUIRING DESIGN EXCEPTION

It is recommended that a reduction in the AASHTO desirable lane width be considered at two locations on I-75. Based on the 2004 AASHTO Geometric Design of Highways and Streets, the desirable width of a travel lane is 12 ft. The lanes would be reduced , or remain at 11 ft.

The first location is on I-75 where the southbound and northbound general purpose lanes would be reduced from 12 ft to 11 ft from mile post 258.8 to mile post 259.1. In the southbound lanes the two inside lanes would be reduced to 11 ft while the two outside lanes would be maintained at 12 ft wide. The northbound through lanes would all be reduced to 11 ft. The lane width reduction is recommended as a result of the extension of existing HOV lane at Akers Mill Rd to meet the managed lane reversible ramp through two existing overpass bridges. The I-285 bridge over I-75 and the US 41 Westbound C-D bridge over I-75 have short spans that create the need for the reduction.

The second location is further north on I-75. It is recommended that the southbound lanes under Windy Hill Rd bridge would be maintained at 11 ft. As part of the modifications to introduce the reversible managed lane ramp from I-75 the existing travel lanes under the Windy Hill Rd over I-75 southbound lanes would be milled and inlaid. These lanes are 11 ft wide currently and are proposed to remain the same. The lane widths would be maintained from mile post 259.9 to mile post 260.

TRAFFIC AND ACCIDENT DATA

Traffic data to be included in Final Design Phase.

Crash/Year	2006	2007	2008	Total
Angle	28	18	24	70
Rear End	195	184	180	559
Side Swipe	112	88	86	286
Fix Object	66	69	53	188
Other	10	17	15	42
Total	411	376	180	

The latest year that complete accident data is available is 2008. Accident data collected in the project area (Milepost 258.84 to 260.07 on I-575) was from 2006-2008.

COST TO MEET CURRENT GUIDELINES

The cost to meet the desirable 12 ft travel lanes on I-75 under the I-285 and US 41 Westbound C-D bridges is currently estimated at $6,175,000. This cost estimate represents replacing the current bridges with bridges of the same alignment but with longer span arrangements.

The current cost estimate to meet the desirable 12 ft travel lanes under the Windy Hill Rd bridge is currently estimated at $5,394,000. This cost estimate represents replacing the bridge. Both of the cost estimates to meet the current guidelines are preliminary engineers estimates and do not include costs for the maintenance of traffic for stage constructing these bridges.

MITIGATING FACTORS

The first location is approximately 1,700 ft in total length of reduced lane width. The second location is approximately 600 ft in total length.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of this exception.

Design Exception for Lane Width:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0073-03(242), Cobb County** I-75 Reversible Managed Lanes P.I. No. 714130	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Exception – Reduced Shoulders Under Bridges – NWC-E-002**		

Approval of a Design Exception is requested for this project.

PROJECT DESCRIPTION

NH000-0073-03(242) would add reversible managed lanes along I-75 in Cobb County. The project crosses the city limits of both Marietta and Kennesaw. The managed lanes would be located outside and west of the existing general purpose lanes on I-75 from I-285 to just south of I-575. The anticipated profile in this area is mostly elevated to limit disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. The managed lane typical section between Windy Hill Rd and I-575 consists of two (2) – 12 ft lanes with a 10 ft shoulder to the west and a 2 ft shoulder on the east. The eastern shoulder varies from the base condition of 2 ft to 12 ft to address sight distance problems. At I-575 the two managed lanes would split and one lane is added in the median of both I-575(NH000-0575-01(028), PI No. 713640) and I-75. In each location the managed lane is adjacent to the northbound travel lanes. The typical section north of I-575 is one 12 ft lane with a 10 ft shoulder to the west and 4 ft shoulder to the east. The managed lanes would be planned for a 55 mph speed design. There would be managed lane interchanges at Terrill Mill Rd, Roswell Rd, Big Shanty Connector (Future construction) and Hickory Grove Rd.

On I-75 the project would begin just south of Akers Mill Rd with the extension of the existing HOV lanes north to 1,000 ft north of Windy Ridge Pkwy. At this point a flyover ramp is proposed to connect I-75 to the reversible managed lanes on the west side of existing I-75. I-75 southbound general purpose lanes are proposed to be relocated west between Windy Hill Rd and Windy Ridge Parkway to accommodate this flyover ramp. From this point the managed lanes remain west of I-75 general purpose lanes on either bridge or wall structure. The construction limits on I-75 in the area of I-285 would begin at mile post 258.4 and end at mile post 260.

At Bells Ferry Rd the managed lanes would transition from the western outside location to the median of I-75. Both I-75 southbound and northbound general purpose lanes are partially relocated to the outside to create the necessary width for the interior managed lanes. From the median location one lane would continue north to Hickory Grove Rd on I-75 and one lane would exit to I-575 via a ramp over the I-75 northbound general purpose lanes. The limits of construction on I-75 at the I-575 interchange would begin at mile post 267.8 and end at mile post 269.

On I-75 in the area of Hickory Grove Rd the northbound general purpose lanes and also partially relocated to the outside to provide the necessary median width for the managed lane interchange. The widening and relocation of I-75 northbound would occur from mile post 273.3 to mile post 274.6.

On I-285 connections are provided into the reversible managed lanes. The connections to I-285 are unique on each side of I-285. To the west of I-75 the reversible managed lanes would connect to I-285 via a single lane reversible ramp that enters/exits from the median. On the east side of I-75 single lane directional ramps are proposed for both I-285 eastbound and westbound. The directional ramps were proposed on the east side of I-75 through coordination with the Department and the Revive I-285 managed lane study. The limits of construction on I-285 would stretch from mile post 20.2 to mile post 20.9.

FEATURES REQUIRING DESIGN EXCEPTION

There are several locations where shoulders would be reduced under existing bridges. The locations and reduced widths that are recommended are as follows:

A. I-285 over I-75 (MP 258.8 to 258.9)
    1. I-75 NB HOV Lane, 2 ft inside shoulder (4 ft desirable)
    2. I-75 NB General Purpose Lanes, 5 ft 2 in outside shoulder (12 ft desirable)
    3. I- 75 SB HOV Lane, 2 ft inside shoulder (4 ft desirable)
B. US 41 Westbound C-D over I-75 (MP 258.9 to 259.1)
    1. I-75 NB HOV Lane, 2 ft inside shoulder (4 ft desirable)
    2. I-75 NB General Purpose Exit to I-285 Westbound, 4 ft 9 in outside shoulder (10 ft desirable)
    3. I- 75 SB HOV Lane, 2 ft inside shoulder (4 ft desirable)
    4. I-75 SB General Purpose Lanes, 3 ft 1 in outside shoulder (12 ft desirable)
C. Windy Hill Rd over I-75 (MP 259.9 to 260)
    1. I-75 NB General Purpose Lanes, 5 ft inside shoulder (10 ft desirable)
    2. I-75 SB General Purpose Lanes, 6 ft 3 in inside shoulder (10 ft desirable)
    3. I-75 SB General Purpose Lanes, 4 ft 4 in outside shoulder (12 ft desirable)
D. I-575 over I-75 (MP 268.6 to 268.7)
    1. I-75 NB General Purpose Lanes, 10 ft outside shoulder (12 ft desirable)
    2. I-75 SB General Purpose Lanes, 6 ft 6 in outside shoulder (12 ft desirable)
E. Chastain Rd over I-75 (MP 271.1)
    1. I-75 Reversible Managed Lane, 4 ft eastern shoulder (6 ft desirable)

TRAFFIC AND ACCIDENT DATA

Traffic data to be included in Final Design Phase.

Table A: (Milepost 258.3 to 259.4)

Crash/Year	2006	2007	2008	Total
Angle	25	18	21	64
Rear End	157	154	149	460
Side Swipe	59	51	51	161
Fix Object	64	65	48	177
Other	9	13	11	33
Total	314	301	280	

Table B: (Milepost 258.4 to 259.6)

Crash/Year	2006	2007	2008	Total
Angle	25	18	21	64
Rear End	160	154	149	463
Side Swipe	59	51	52	162
Fix Object	64	65	48	177
Other	9	13	11	33
Total	317	301	281	

Table C: (Milepost 259.4 to 260.5)

Crash/Year	2006	2007	2008	Total
Angle	29	17	26	72
Rear End	196	199	164	559
Side Swipe	86	79	71	236
Fix Object	24	24	26	74
Other	4	12	13	29
Total	339	331	970	

Table D: (Milepost 268.1 to 269.2)

Crash/Year	2006	2007	2008	Total
Angle	17	14	16	47
Rear End	124	127	108	359
Side Swipe	36	35	42	113
Fix Object	14	16	6	36
Other	8	5	5	18
Total	199	197	177	

Table E: (Milepost 270.6 to 271.6)

Crash/Year	2006	2007	2008	Total
Angle	21	17	18	56
Rear End	117	133	109	359
Side Swipe	32	41	60	133
Fix Object	8	12	21	41
Other	10	9	23	42
Total	188	212	231	

The latest year that complete accident data is available is 2008. Accident data collected in the project area was from 2006-2008.

COST TO MEET CURRENT GUIDELINES

The cost estimate to meet the desirable shoulder widths at each location are as follows:

A. $4,050,000

B. $2,125,000
C. $5,394,000
D. $3,490,000
E. $3,850,000

These cost estimates represent replacement of existing bridges and are preliminary engineers estimates and do not include costs for maintenance of traffic for staged construction.

MITIGATING FACTORS

A. The total length of the reduced shoulders is approximately 300 ft.
B. The total length of the reduced shoulders is approximately 400 ft.
C. The inside shoulders of both I-75 northbound and southbound match the existing condition. The total length of the reduced shoulders is approximately 600 ft.
D. The total length of the reduced shoulders is approximately 750 ft.
E. The total length of the reduced shoulder is approximately 500 ft.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of this exception.

Design Exception for Reduced Shoulders at Bridges:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0073-03(242), Cobb County** I-75 Reversible Managed Lanes P.I. No. 714130	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Exception – Reduced Shoulders Managed Lanes – NWC-E-003**		

Approval of a Design Exception is requested for this project.

PROJECT DESCRIPTION

NH000-0073-03(242) would add reversible managed lanes along I-75 in Cobb County. The project crosses the city limits of both Marietta and Kennesaw. The managed lanes would be located outside and west of the existing general purpose lanes on I-75 from I-285 to just south of I-575. The anticipated profile in this area is mostly elevated to limit disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. The managed lane typical section between Windy Hill Rd and I-575 consists of two (2) – 12 ft lanes with a 10 ft shoulder to the west and a 2 ft shoulder on the east. The eastern shoulder varies from the base condition of 2 ft to 12 ft to address sight distance problems. At I-575 the two managed lanes would split and one lane is added in the median of both I-575(NH000-0575-01(028), PI No. 713640) and I-75. In each location the managed lane is adjacent to the northbound travel lanes. The typical section north of I-575 is one 12 ft lane with a 10 ft shoulder to the west and 4 ft shoulder to the east. The managed lanes would be planned for a 55 mph speed design. There would be managed lane interchanges at Terrill Mill Rd, Roswell Rd, Big Shanty Connector (Future construction) and Hickory Grove Rd.

On I-75 the project would begin just south of Akers Mill Rd with the extension of the existing HOV lanes north to 1,000 ft north of Windy Ridge Pkwy. At this point a flyover ramp is proposed to connect I-75 to the reversible managed lanes on the west side of existing I-75. I-75 southbound general purpose lanes are proposed to be relocated west between Windy Hill Rd and Windy Ridge Parkway to accommodate this flyover ramp. From this point the managed lanes remain west of I-75 general purpose lanes on either bridge or wall structure. The construction limits on I-75 in the area of I-285 would begin at mile post 258.4 and end at mile post 260.

At Bells Ferry Rd the managed lanes would transition from the western outside location to the median of I-75. Both I-75 southbound and northbound general purpose lanes are partially relocated to the outside to create the necessary width for the interior managed lanes. From the median location one lane would continue north to Hickory Grove Rd on I-75 and one lane would exit to I-575 via a ramp over the I-75 northbound general purpose lanes. The limits of construction on I-75 at the I-575 interchange would begin at mile post 267.8 and end at mile post 269.

On I-75 in the area of Hickory Grove Rd the northbound general purpose lanes and also partially relocated to the outside to provide the necessary median width for the managed lane interchange. The widening and relocation of I-75 northbound would occur from mile post 273.3 to mile post 274.6.

On I-285 connections are provided into the reversible managed lanes. The connections to I-285 are unique on each side of I-285. To the west of I-75 the reversible managed lanes would connect to I-285 via a single lane reversible ramp that enters/exits from the median. On the east side of I-75 single lane directional ramps are proposed for both I-285 eastbound and westbound. The directional ramps were proposed on the east side of I-75 through coordination with the Department and the Revive I-285 managed lane study. The limits of construction on I-285 would stretch from mile post 20.2 to mile post 20.9.

FEATURES REQUIRING DESIGN EXCEPTION

The reversible managed lanes on I-75 are proposed with less than desirable shoulders. The two (2) lane reversible managed lanes section consists of two (2) – 12 ft travel lanes with the western shoulder 10 ft wide and the eastern shoulder 2 ft wide. The eastern shoulder varies from 2 ft to 12 ft at horizontal curves to meet required visibility for stopping sight distance. The one lane reversible managed lane section consists of one – 12 ft travel lane with the western shoulder 10 ft wide and the eastern shoulder 4 ft wide. The eastern shoulders on both the two (2) lane and one lane reversible section are proposed as reduced per the 2004 AASHTO Guide for High-Occupancy Vehicle Facilities.

The desirable requirements for a two (2) lane reversible lane section are both shoulders 10 ft wide. The desirable requirements for a one lane reversible lane section are both shoulders 5 ft wide. These requirements are based on the 2004 AASHTO Guide for High-Occupancy Vehicle Facilities.

It is recommended that the reduced shoulders as detailed in the 2004 AASHTO Guide for High-Occupancy Vehicle Facilities be approved.

TRAFFIC AND ACCIDENT DATA

Traffic data to be included in Final Design Phase.

Accident date is not applicable.

COST TO MEET CURRENT GUIDELINES

The cost estimate to meet the desirable shoulder widths at each location are as follows:

- Two (2) Lane Reversible = $25,809,000
- One Lane Reversible = $1,670,000

These cost estimates represent the necessary additional shoulder width and are preliminary engineers estimates.

MITIGATING FACTORS

Two Lane Reversible:

Through consultation with GDOT the proposed shoulders were selected to minimize project costs.

One Lane Reversible:

The one lane reversible section utilizes a 4 ft shoulder to the east to maximize the use of additional pavement currently in place. In 2007 GDOT replaced the pavement on I-75 from Barrett Pkwy to north of Hickory Grove Rd. To aid in the staging of the new concrete pavement the inside shoulders were overbuilt to 14 ft. The proposed one lane reversible would be constructed adjacent to I-75 northbound general purpose lanes. From the inside edge of travel on I-75 NB a precast barrier would be placed with an offset of 8 ft. With the precast barrier 2 ft wide and a managed lane shoulder of 4 ft the existing shoulder would remain without any modification. The benefit being that only the reversible managed lane and western shoulder would have to be built.

Also, the one lane reversible section has a 10 ft shoulder on the west. The desirable shoulders based on AASHTO Guide for HOV Facilities are 5 ft on each side with barriers. The proposed one lane reversible's 10 ft shoulder is graded without the use of a barrier.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of these exceptions.

Design Exception for Reduced Shoulders on Managed Lanes as noted:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0073-03(242), Cobb County** I-75 Reversible Managed Lanes P.I. No. 714130	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Exception – Reduced Shoulder General Purpose Lanes – NWC-E-004**		

Approval of a Design Exception is requested for this project.

PROJECT DESCRIPTION

NH000-0073-03(242) would add reversible managed lanes along I-75 in Cobb County. The project crosses the city limits of both Marietta and Kennesaw. The managed lanes would be located outside and west of the existing general purpose lanes on I-75 from I-285 to just south of I-575. The anticipated profile in this area is mostly elevated to limit disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. The managed lane typical section between Windy Hill Rd and I-575 consists of two (2) – 12 ft lanes with a 10 ft shoulder to the west and a 2 ft shoulder on the east. The eastern shoulder varies from the base condition of 2 ft to 12 ft to address sight distance problems. At I-575 the two managed lanes would split and one lane is added in the median of both I-575(NH000-0575-01(028), PI No. 713640) and I-75. In each location the managed lane is adjacent to the northbound travel lanes. The typical section north of I-575 is one 12 ft lane with a 10 ft shoulder to the west and 4 ft shoulder to the east. The managed lanes would be planned for a 55 mph speed design. There would be managed lane interchanges at Terrill Mill Rd, Roswell Rd, Big Shanty Connector (Future construction) and Hickory Grove Rd.

On I-75 the project would begin just south of Akers Mill Rd with the extension of the existing HOV lanes north to 1,000 ft north of Windy Ridge Pkwy. At this point a flyover ramp is proposed to connect I-75 to the reversible managed lanes on the west side of existing I-75. I-75 southbound general purpose lanes are proposed to be relocated west between Windy Hill Rd and Windy Ridge Parkway to accommodate this flyover ramp. From this point the managed lanes remain west of I-75 general purpose lanes on either bridge or wall structure. The construction limits on I-75 in the area of I-285 would begin at mile post 258.4 and end at mile post 260.

At Bells Ferry Rd the managed lanes would transition from the western outside location to the median of I-75. Both I-75 southbound and northbound general purpose lanes are partially relocated to the outside to create the necessary width for the interior managed lanes. From the median location one lane would continue north to Hickory Grove Rd on I-75 and one lane would exit to I-575 via a ramp over the I-75 northbound general purpose lanes. The limits of construction on I-75 at the I-575 interchange would begin at mile post 267.8 and end at mile post 269.

On I-75 in the area of Hickory Grove Rd the northbound general purpose lanes and also partially relocated to the outside to provide the necessary median width for the managed lane interchange. The widening and relocation of I-75 northbound would occur from mile post 273.3 to mile post 274.6.

On I-285 connections are provided into the reversible managed lanes. The connections to I-285 are unique on each side of I-285. To the west of I-75 the reversible managed lanes would connect to I-285 via a single lane reversible ramp that enters/exits from the median. On the east side of I-75 single lane directional ramps are proposed for both I-285 eastbound and westbound. The directional ramps were proposed on the east side of I-75 through coordination with the Department and the Revive I-285 managed lane study. The limits of construction on I-285 would stretch from mile post 207.4 to mile post 208.6.

FEATURES REQUIRING DESIGN EXCEPTION

There are several locations where shoulders on I-75 and I-285 would not meet the current AASHTO criterion for freeways. The locations are as follows:

A. I-285 (MP 19.4 to 20.2)
   1. I-285 WB General Purpose Lanes, Inside shoulder varies 6.5 ft to 8 ft (10 ft desirable)
   2. I-285 EB General Purpose Lanes, Inside shoulder varies 6.5 ft to 8 ft (10 ft desirable)

B. I-75
   1. I-75 NB General Purpose Lanes (MP 267.8 to 260), 5 ft inside shoulder (10 ft desirable)

C. I-75
   1. I-75 NB General Purpose Lanes (MP 267.8 to 274.6), 8 ft inside shoulder (10 ft desirable)
   2. I-75 SB General Purpose Lanes (MP 267.8 to 269), 8 ft inside shoulder (10 ft desirable)

TRAFFIC AND ACCIDENT DATA

Traffic data to be included in Final Design Phase.

Table A: (Milepost 19.4 to 20.2)

Crash/Year	2006	2007	2008	Total
Angle	16	24	26	66
Rear End	88	87	105	280
Side Swipe	46	35	56	137
Fix Object	23	21	18	62
Other	8	8	8	24
Total	181	175	213	

Table B: (Milepost 259.7 to 260.07)

Crash/Year	2006	2007	2008	Total
Angle	8	12	71	91
Rear End	68	140	58	266
Side Swipe	55	63	38	156
Fix Object	9	14	8	31
Other	3	9	6	18
Total	143	238	181	

Table C: (Milepost 267.8 to 274.6)

Crash/Year	2006	2007	2008	Total
Angle	82	78	87	247
Rear End	575	687	463	1,725
Side Swipe	173	165	201	539
Fix Object	55	73	77	205
Other	54	56	66	176
Total	939	1059	894	

The latest year that complete accident data is available is 2008. Accident data collected in the project area was from 2006-2008.

COST TO MEET CURRENT GUIDELINES

The cost estimates to meet the required shoulder widths at each location are as follows:

A. $95,000
B. $68,000
C. $4,572,000

Items A and B represent the cost of the additional pavement that would be required to meet current AASHTO criterion. The cost estimate for item C represents additional pavement and the replacement of the existing I-575 bridge over I-75. These cost estimates are preliminary engineers estimates and do not include costs for maintenance of traffic for staged construction.

MITIGATING FACTORS

A. The shoulders proposed to be used on I-285 match the existing condition. This area on I-285 between I-75 and US 41/Cobb Parkway is very congested. The close proximity of the eastbound and westbound US 41 C-D on each side of I-285 limits additional width. The widening proposed in this area would modify ramp gores. The further widening would continue to negatively impact ramp entrances and exits.
B. The shoulders proposed to be used on I-75 northbound match the existing condition. The close proximity of the Windy Hill Rd exit from I-75 would require further modification of the exit gore.
C. In 2007 GDOT replaced the pavement on I-75 from Barrett Pkwy to north of Hickory Grove Rd. To aid in the staging of the new concrete pavement the inside shoulders were overbuilt to 14 ft. The proposed one lane reversible would be constructed adjacent to I-75 northbound general purpose lanes. The use of an inside shoulder of 8 ft allows the overbuilt shoulder to be converted into an 8 ft general purpose shoulder, 2 ft precast barrier and 4 ft managed lane shoulder. The benefit being that only the reversible managed lane and outside shoulder would have to be built with little interference to the general purpose lanes.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of this exception.

Design Exception for Reduced Shoulders:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0575-01(028), Cobb and Cherokee Counties** I-575 Reversible Managed Lanes P.I. No. 713640	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Exception – Reduced Shoulders Managed Lanes – NWC-E-005**		

Approval of a Design Exception is requested for this project.

PROJECT DESCRIPTION

NH000-0575-01(028) would add a single reversible managed lane along I-575 in Cobb and Cherokee Counties. The managed lane would be located within the median of the existing general purpose lanes on I-575 from I-75 to just south of Sixes Road. The anticipated project is designed to limit the disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. Therefore all work would be done within the existing 64 ft wide median, building off of the existing horizontal and vertical alignments. The typical section of the projects would build off of the existing northbound inside edge of pavement, allowing for a 12 ft wide reversible lane that would be separated from general purpose traffic with a 1 ft barrier. A 6 ft paved shoulder for the general purpose lanes and a 4 ft paved shoulder for the reversible lane would flank the barrier separating them. In addition, a 10 ft shoulder (6 ft paved) would be added along the reversible lane to the west. For drainage, the existing median would be replaced with a concrete paved ditch between the southbound general purpose lanes and the reversible managed lane. A cable barrier would be installed along the ditch slope closest to the southbound general purpose lanes to meet roadside design guidelines. The managed lanes would be planned for a 55 mph speed design. The existing 65 mph design speed of the north and southbound general purpose lanes would remain.

There would be three left-hand entrances from the southbound general purpose lanes onto the managed reversible lanes. These locations are at Barrett Parkway, Shallowford Road, and at the northern terminus of the project, south of Sixes Road. Counterparts of these three entrances, which would serve as exits to the northbound general purpose lanes, are also proposed. These locations are just north of Barrett Parkway, just north of Shallowford Road, and at the northern terminus of the project, south of Sixes Road.

As these entrances and exits would al be located within the existing 64 ft wide median, the proposed reversible managed lane would require several distinct typical sections to accommodate the merging patterns associated with these movements. Along these sections of the road, additional barriers (Type S) would be required, as appropriate, to separate opposing traffic lanes. As many as three barriers would be proposed in a given cross section in order to achieve this.

Since this project would take place within the existing median, existing bridges on I-575 would be widened to accommodate the additional width. Existing bridges over I-575 would remain unchanged.

Pier protection would be provided for existing piers that lie within the clear zone. Barriers would be required along the reversible lanes as opposed to using guardrail, which is not designed to facilitate bi-directional traffic. The warrant lengths of these barriers would be designed using the 2002 AASHTO Roadside Design Guide.

FEATURES REQUIRING DESIGN EXCEPTION

It is recommended that a reduction in the AASHTO desirable shoulder width of the managed reversible lane be considered for the length of the project. According to the *2004 AASHTO Guide for High-Occupancy Vehicle Facilities*, the desirable shoulder width or lateral clearances to be used for the shoulders surrounding a barrier separated reversible flow HOV lane is 5 ft. However, it is proposed that this shoulder width be reduced to 4 ft in this design. This reduced shoulder would also allow for a deeper ditch section where ditch capacity is an issue.

TRAFFIC AND ACCIDENT DATA

Traffic and accident data to be included in Final Design Phase.

COST TO MEET CURRENT GUIDELINES

The cost to meet the desirable 5 ft shoulders is currently estimated to be $2,000,000 more than using a reduced 4 ft wide shoulder. This cost estimate represents a 5 ft wide shoulder for the entire 10.3 miles of the project and an increased need for barrier. This cost estimate represents a preliminary engineering estimate that is rough in its order magnitude.

MITIGATING FACTORS

By reducing the shoulder width, a deeper ditch could be placed inside the existing median. This increased ditch depth would increase the capacity of the open-channel ditch, which would reduce the need for a closed drainage system and the number of drop inlets required.

Also, the one lane reversible section has an 8 ft shoulder on the west. The desirable shoulders based on AASHTO Guide for HOV Facilities are 5 ft on each side with barriers. The proposed one lane reversible's 8 ft paved shoulder is graded without the use of a barrier.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of this exception.

Design Exception Reduced Shoulders on Managed Lanes:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date

REV A

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0575-01(028), Cobb and Cherokee Counties** I-575 Reversible Managed Lanes P.I. No. 713640	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Exception – Reduced Shoulders Under Bridges – NWC-E-006**		

Approval of a Design Exception is requested for this project.

PROJECT DESCRIPTION

NH000-0575-01(028) would add a single reversible managed lane along I-575 in Cobb and Cherokee Counties. The managed lane would be located within the median of the existing general purpose lanes on I-575 from I-75 to just south of Sixes Road. The anticipated project is designed to limit the disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. Therefore all work would be done within the existing 64 ft wide median, building off of the existing horizontal and vertical alignments. The typical section of the projects would build off of the existing northbound inside edge of pavement, allowing for a 12 ft wide reversible lane that would be separated from general purpose traffic with a 1 ft barrier. A 6 ft paved shoulder for the general purpose lanes and a 4 ft paved shoulder for the reversible lane would flank the barrier separating them. In addition, a 10 ft shoulder (6 ft paved) would be added along the reversible lane to the west. For drainage, the existing median would be replaced with a concrete paved ditch between the southbound general purpose lanes and the reversible managed lane. A cable barrier would be installed along the ditch slope closest to the southbound general purpose lanes to meet roadside design guidelines. The managed lanes would be planned for a 55 mph speed design. The existing 65 mph design speed of the north and southbound general purpose lanes would remain.

There would be three left-hand entrances from the southbound general purpose lanes onto the managed reversible lanes. These locations are at Barrett Parkway, Shallowford Road, and at the northern terminus of the project, south of Sixes Road. Counterparts of these three entrances, which would serve as exits to the northbound general purpose lanes, are also proposed. These locations are just north of Barrett Parkway, just north of Shallowford Road, and at the northern terminus of the project, south of Sixes Road.

As these entrances and exits would al be located within the existing 64 ft wide median, the proposed reversible managed lane would require several distinct typical sections to accommodate the merging patterns associated with these movements. Along these sections of the road, additional barriers (Type S) would be required, as appropriate, to separate opposing traffic lanes. As many as three barriers would be proposed in a given cross section in order to achieve this.

Since this project would take place within the existing median, existing bridges on I-575 would be widened to accommodate the additional width. Existing bridges over I-575 would remain unchanged. Pier protection would be provided for existing piers that lie within the clear zone. Barriers would be

required along the reversible lanes as opposed to using guardrail, which is not designed to facilitate bi-directional traffic. The warrant lengths of these barriers would be designed using the 2002 AASHTO Roadside Design Guide.

FEATURES REQUIRING DESIGN EXCEPTION

There are several locations where shoulders would be reduced under existing bridges. The locations and reduced widths that are recommended are as follows:

A. Chastain Road over I-75 (MP 0.3 to 0.4)
    1. I-575 Reversible Managed Lane, 2.1 ft inside shoulder (10 ft desirable)
B. North Booth Road over I-75 (MP 2.9 to 3.0)
    1. I-575 Reversible Managed Lane, 3.9 ft inside shoulder (10 ft desirable)
C. SR 92 over I-75 (MP 6.2 to 6.3)
    1. I-575 Reversible Managed Lane, 1.1 ft inside shoulder (10 ft desirable)
D. Dupree Road over I-75 (MP 7.0 to 7.1)
    11. I-575 Reversible Managed Lane, 4.6 ft inside shoulder (10 ft desirable)
E. Old Rope Mill Road over I-75 (MP 9.1 to 9.2)
    11. I-575 Reversible Managed Lane, 4.0 ft inside shoulder (10 ft desirable)

TRAFFIC AND ACCIDENT DATA

Traffic and accident data to be included in Final Design Phase.

COST TO MEET CURRENT GUIDELINES

The cost estimate to meet the desirable shoulder widths at each location are as follows:

A. $3,396,000
B. $1,056,000
C. $4,672,000
D. $1,670,000
E. $1,089,000

These cost estimates represent replacement of existing bridges and are preliminary engineers estimates and do not include costs for the maintenance of traffic for stage construction.

MITIGATING FACTORS

A. The total length of the reduced shoulder is approximately 450 ft
B. The total length of the reduced shoulder is approximately 260 ft.
C. The total length of the reduced shoulder is approximately 525 ft.
D. The total length of the reduced shoulder is approximately 225 ft.
E. The total length of the reduced shoulder is approximately 225 ft.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of this exception.

REV A

Design Exception for Reduced Shoulders at Bridges:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date

REV A

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE	**NH000-0073-03(242), Cobb County** I-75 Reversible Managed Lanes P.I. No. 714130	OFFICE	Innovative Program Delivery
FROM	Darryl VanMeter, P.E., Innovative Program Delivery	DATE	December 14, 2009
TO	Brian Summers, P.E., Project Review Engineer		
SUBJECT	**Request for Design Variance – Vertical Clearance – NWC-V-001**		

Approval of a Design Variance is requested for this project.

PROJECT DESCRIPTION

NH000-0073-03(242) would add reversible managed lanes along I-75 in Cobb County. The project crosses the city limits of both Marietta and Kennesaw. The managed lanes would be located outside and west of the existing general purpose lanes on I-75 from I-285 to just south of I-575. The anticipated profile in this area is mostly elevated to limit disturbance to local topography, cross streets, environmental resources and other existing features within the corridor. The managed lane typical section between Windy Hill Rd and I-575 consists of two (2) – 12 ft lanes with a 10 ft shoulder to the west and a 2 ft shoulder on the east. The eastern shoulder varies from the base condition of 2 ft to 12 ft to address sight distance problems. At I-575 the two managed lanes would split and one lane is added in the median of both I-575(NH000-0575-01(028), PI No. 713640) and I-75. In each location the managed lane is adjacent to the northbound travel lanes. The typical section north of I-575 is one 12 ft lane with a 10 ft shoulder to the west and 4 ft shoulder to the east. The managed lanes would be planned for a 55 mph speed design. There would be managed lane interchanges at Terrill Mill Rd, Roswell Rd, Big Shanty Connector (Future construction) and Hickory Grove Rd.

On I-75 the project would begin just south of Akers Mill Rd with the extension of the existing HOV lanes north to 1,000 ft north of Windy Ridge Pkwy. At this point a flyover ramp is proposed to connect I-75 to the reversible managed lanes on the west side of existing I-75. I-75 southbound general purpose lanes are proposed to be relocated west between Windy Hill Rd and Windy Ridge Parkway to accommodate this flyover ramp. From this point the managed lanes remain west of I-75 general purpose lanes on either bridge or wall structure. The construction limits on I-75 in the area of I-285 would begin at mile post 258.4 and end at mile post 260.

At Bells Ferry Rd the managed lanes would transition from the western outside location to the median of I-75. Both I-75 southbound and northbound general purpose lanes are partially relocated to the outside to create the necessary width for the interior managed lanes. From the median location one lane would continue north to Hickory Grove Rd on I-75 and one lane would exit to I-575 via a ramp over the I-75 northbound general purpose lanes. The limits of construction on I-75 at the I-575 interchange would begin at mile post 267.8 and end at mile post 269.

On I-75 in the area of Hickory Grove Rd the northbound general purpose lanes and also partially relocated to the outside to provide the necessary median width for the managed lane interchange. The widening and relocation of I-75 northbound would occur from mile post 273.3 to mile post 274.6.

On I-285 connections are provided into the reversible managed lanes. The connections to I-285 are unique on each side of I-285. To the west of I-75 the reversible managed lanes would connect to I-285 via a single lane reversible ramp that enters/exits from the median. On the east side of I-75 single lane directional ramps are proposed for both I-285 eastbound and westbound. The directional ramps were proposed on the east side of I-75 through coordination with the Department and the Revive I-285 managed lane study. The limits of construction on I-285 would stretch from mile post 20.2 to mile post 20.9.

FEATURES REQUIRING DESIGN VARIANCE

It is recommended that a reduction in the GDOT minimum vertical clearance be considered. Based on the 2008 GDOT Design Policy Manual, Table 6.4 GDOT Design Standards for Freeways, the minimum vertical clearance is 16.75 to 17.5 ft. The vertical clearance of the reversible managed lanes over the I-75 southbound exit ramp to North Marietta Pkwy would be 16.5 ft. The minimum vertical clearance point would be located at mile point 265.2 on I-75.

The point of minimum vertical clearance along the North Marietta Pkwy ramp would be controlled by the overhead power lines owned by Georgia Power Transmission. There are two (2) overhead power lines, a 230 kV and a 115 kV, that require clearances of 30 ft and 25 ft respectively, according to Georgia Power. The reversible managed lanes would be on structure to span the ramp and would be pinched between the roadway and power lines. The proposed structure depth has been minimized at this location.

TRAFFIC AND ACCIDENT DATA

Traffic data to be included in Final Design Phase.

Accident data is not applicable.

COST TO MEET CURRENT GUIDELINES

The cost to meet the GDOT minimum clearance value of 16.75 ft would be approximately $1,000,000, plus the cost of staging,etc. This estimate is based on typical planning estimate values for replacement of transmission towers.

MITIGATING FACTORS

The minimum vertical clearance based on the 2004 AASHTO Geometric Design of Highways and Streets is 14.5 ft with a desirable clearance of 16.5 ft. The proposed vertical clearance at the I-75 southbound exit to North Marietta Pkwy meets this criterion.

RECOMMENDATION

Based on the information contained in this request, the Office of Innovative Program Delivery recommends approval of this variance.

Design Exception for Lane Width:

Recommend:_____
Chief Engineer

Approved:_____ _____
FHWA Division Administrator Date